

CLAIMS

WE CLAIM:

1. A filter configured to be disposed within an air passage, for providing filtered air to a pneumatically controlled component, comprising:
a main body having first and second ends and a passageway extending therebetween, a leading edge, a trailing edge, and first and second sides, the first and second sides converging at least proximate the trailing edge and separated from one another by a longitudinal slit that extends along a section thereof,
wherein the leading edge is configured to divide a main airflow containing particles into first and second airflow portions, the first airflow portion containing particles and being directed through the air passage and the second airflow portion being substantially particle-free and directed through the longitudinal slit into the main body passage.
2. The filter of claim 1, further comprising:
a sleeve coupled to the main body first end.
3. The filter of claim 2, wherein the main body second end includes a seal.
4. The filter of claim 3, wherein the seal is an epoxy resin.
5. The filter of claim 3, wherein the seal is a brazing alloy brazed to the second end.
6. The filter of claim 1, wherein the leading edge has a curved shape.

7. The filter of claim 1, wherein the leading edge has a beveled shape.
8. The filter of claim 1, wherein the longitudinal slit extends the length of the main body.
9. The filter of claim 1, wherein the longitudinal slit has sharp edges.
10. The filter of claim 1, wherein the width of the longitudinal slit is between about .005-.010 inches.
11. The filter of claim 1, wherein first and second sides have an angle between them of between about 10-20 degrees.
12. The filter of claim 1, wherein the first and second sides have an angle between them of about 13 degrees.
13. The filter of claim 1, wherein the main body has a wing-shaped cross section.

14. A fluid control valve comprising:

- a duct;
- a valve disposed within the duct;
- an actuator coupled to the valve;
- a servo coupled to the actuator; and
- a filter disposed within the duct and in fluid communication with

the servo, the filter comprising:

- a main body having first and second ends and a passageway extending therebetween, a leading edge, a trailing edge, and first and second sides, the first and second sides converging at least proximate the trailing edge and separated from one another by a longitudinal slit that extends along a section thereof,

- wherein the leading edge is configured to divide a main airflow containing particles into first and second airflow portions, the first airflow portion containing particles and being directed through the air passage and the second airflow portion being substantially particle-free and directed through the longitudinal slit into the main body passage.

15. The filter of claim 14, wherein the longitudinal slit has sharp edges.

16. The filter of claim 14, wherein the width of the longitudinal slit is between about .005-.010 inches.

17. The filter of claim 14, wherein the first and second sides have an angle between them of between about 10-20 degrees.

18. A method of constructing a filter, the method comprising:
 - shaping a tube to include a leading edge, a trailing edge, first and second ends and a passageway that extends therebetween;
 - cutting a longitudinal slit into the tube trailing edge; and
 - sealing the tube first end.
19. The method of claim 18, wherein shaping the tube further includes shaping the tube into a wing-shape.
20. The method of claim 18, further comprising:
 - sharpening the longitudinal slit of the tube trailing edge.
21. The method of claim 18, further comprising:
 - coupling a sleeve to the tube second end.
22. The method of claim 18, wherein the step of shaping the tube further comprises inserting a mold having a wing shape into the tube and crimping the tube around the mold.

23. A filter configured to be disposed within an air passage, for providing filtered air to a pneumatically controlled component, comprising:
- a main body having first and second ends and a passageway extending therebetween, at least a portion of the main body being wing-shaped, the wing-shaped portion including a leading edge and a trailing edge, the trailing edge having a longitudinal slit therethrough that extends along a section thereof,
 - wherein the wing-shaped portion is configured to divide a main airflow containing particles into first and second airflow portions, the first airflow portion containing particles and being directed through the air passage and the second airflow portion being substantially particle-free and directed through the longitudinal slit into the tube passage.
24. The filter of claim 23, further comprising:
- a sleeve coupled to the main body first end.
25. The filter of claim 24, wherein the main body second end includes a seal.
26. The filter of claim 25, wherein the seal is an epoxy resin.
27. The filter of claim 25, wherein the seal is a brazing alloy brazed to the second end.
28. The filter of claim 23, wherein the leading edge has a curved shape.
29. The filter of claim 23, wherein the leading edge has a beveled shape.
30. The filter of claim 23, wherein the longitudinal slit extends the length of the wing-shaped portion.

- 31. The filter of claim 23, wherein the longitudinal slit has sharp edges.
- 32. The filter of claim 23, wherein the width of the longitudinal slit is between about .005-.010 inches.
- 33. The filter of claim 23, wherein first and second sides have an angle between them of between about 10-20 degrees.
- 34. The filter of claim 23, wherein the first and second sides have an angle between them of about 13 degrees.